

IN THE CLAIMS

The following is a complete, marked up listing of revised claims with a status identifier in parentheses, underlined text indicating insertions, and strikethrough and/or double-bracketed text indicating deletions.

LISTING OF CLAIMS

Claims 1-11 (Cancelled).

12. (Currently Amended) A method of optimizing transmit covariance for a multiple antenna transmitter, comprising:
determining spatial steering of parallel symbol streams and a transmit power of each symbol stream based on a statistical distribution of a channel. ~~The method of claim 11,~~
~~wherein the determining step, for each symbol stream, comprises:~~including,

determining a first possible transmission power based on a k th transmission power for the symbol stream, where k represents an interval of time; τ_1

determining a second possible transmission power based on the k th transmission power for the symbol stream and the statistical distribution of the channel; τ_2 and

determining the $(k+1)$ th transmission power for the symbol stream based on the first and second possible transmission powers.

13. (Original) The method of claim 12, wherein the determining the $(k+1)$ th transmission power further comprises:

selecting one of the first and second possible transmission powers; and

scaling the selected transmission powers for the symbol streams so that a sum of the selected transmission powers for the symbol streams does not exceed an available amount of power at a transmitter, the scaled selected transmission powers serving as the (k+1)th transmission powers.

14. (Original) The method of claim 13, wherein the selecting step selects a maximum one of the first and second possible transmission powers.

15. (Original) The method of claim 12, wherein the determining a second possible transmission power step determines the second possible transmission power based on the (k)th transmission power, the statistical distribution of the channel, and an available amount of power at a transmitter.

16. (Original) The method of claim 12, wherein the determining a second possible transmission power step determines the second possible transmission power based on the (k)th transmission power, the statistical distribution of the channel, and a noise power at a receiver.

17. (Original) The method of claim 12, wherein the determining a second possible transmission power step determines the second possible transmission power based on the (k)th transmission power, the statistical distribution of the channel and a number of receive antennas.

18. (Original) The method of claim 12, wherein the determining the second possible transmission powers step determines the second possible transmission powers according to the following expression:

for $m=1, \dots, M$, where M is the number of transmit antennas,

$$p'_m(k+1) = \max \left(p_m(k), \frac{E \left[\text{Tr} \left\{ B_{-m} + \frac{P}{M\sigma^2} \tilde{H}_m \tilde{H}_m^H A \right\} \right] - N}{E \left[\frac{\tilde{H}_m (B_{-m})^2 \tilde{H}_m^H}{M\sigma^2 + p_m(k) \tilde{H}_m B_{-m} \tilde{H}_m^H} \right]} \right)$$

where $p'_m(k+1)$ is a $(k+1)$ th second possible transmission power for the m th symbol stream, H represents the statistical distribution of the channel, $\tilde{H} = HV$ with V computed to be the eigenvectors of $E[H^H H]$, N is a number of receive antennas, σ^2 indicates an arithmetic mean of the noise variances at the N receive antennas, matrix A is given by,

$$A = \left(I + \frac{1}{M\sigma^2} \tilde{H} P(k) \tilde{H}^H \right)^{-1}$$

while the M matrices B_{-m} , $m=1, \dots, M$, are given by

$$B_{-m} = \left(I + \frac{1}{M\sigma^2} \tilde{H}_{-m} P_{-m}(k) \tilde{H}_{-m}^H \right)^{-1}$$

where $\tilde{\mathbf{H}}_{-m}$ and $\mathbf{P}_{-m}(k)$ indicate the corresponding matrices without the m -th column, and $\tilde{\mathbf{H}}_m$ denotes the m -th column of $\tilde{\mathbf{H}}$.

19. (Currently Amended) A method of optimizing transmit covariance for a multiple antenna transmitter, comprising:

determining spatial steering of parallel symbol streams and a transmit power of each symbol stream based on a statistical distribution of a channel. The method of claim 7,
~~wherein the determining step determines~~determining a transmission power for each symbol stream that tracks an optimal transmission power for the symbol stream based on a previously determined transmission power for the symbol stream and the statistical distribution of the channel.